

Remarks/Arguments

Summary of the Office Action

In paragraph one of the office action the Examiner notes that claims 1-21 are presented for examination.

Claims 1-21 are rejected under 35 U.S.C. §103(a).

Claims 1, 7, 10, 12, 16, 17, and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng et al. (U.S. Patent No. 5,557,791) (hereinafter Cheng), and Chaudhuri et al. (U.S. Patent No. 6,169,983) (hereinafter Chaudhuri).

Claims 2, 3, 4, 6, 11, 13, 14, 18, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Whang et al. (U.S. Patent No. 6,349,308) (hereinafter Whang).

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng, Chaudhuri and Whang, and further in view of Beavin et al. (U.S. Patent No. 6,272,487).

Claims 8, 9, and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Nelson et al. (U.S. Patent No. 6,243,713).

The Present Claims Patentably Distinguish Over The References Of Record

35 U.S.C. § 103(a)

Claims 1, 7, 10, 12, 16, 17, and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri.

Claims 2, 3, 4, 6, 11, 13, 14, 18, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Whang.

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng, Chaudhuri and Whang, and further in view of Beavin.

Claims 8, 9, and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Nelson.

The Applicant asserts that for each rejected claim that the references, either individually or in combination, do not teach or suggest each and every claimed element and/or limitation and thus the 35 U.S.C. § 103(a) rejections should be withdrawn. Additionally, the basis for each claim rejection in the Office Action provides no motivation to combine the references in the proffered manner.

Claims 1, 10, 16

With respect to the independent claims 1, 10, and 16, neither Cheng nor Chaudhuri disclose generating a combined index of the structured and unstructured data that facilitates associative access to a database that includes both structured and unstructured data columns, where the query may include both structured and unstructured conditions. Thus, claims 1, 10, and 16 are not obvious in light of Cheng and Chaudhuri. Similarly, claims 2-9 that depend from claim 1, claims 11-15 that depend from claim 10, and claims 17-21 that depend from claim 16 contain the same or similar claimed elements and are likewise not obvious in light of Cheng and Chaudhuri.

Claim 1

Claim 1 concerns a method of generating an index to provide access to a database that includes both structured and unstructured data columns. Applicant agrees that Cheng discloses that a database may include a table that has a structured column and another table that has an unstructured data column. However, claim 1 includes more. Claim 1 includes generating a combined index of the unstructured and structured data columns, where the combined index provides associative access to the database using a query that includes both structured and unstructured conditions.

While Cheng discloses an outer join between tables that may include structured and unstructured data, Cheng does not disclose building a combined index. Cheng discloses performing the outer join and displaying a resulting table. Furthermore, Cheng only discloses queries that use structured conditions. Cheng does not disclose queries that combine structured and unstructured conditions. For example, the conditions that the Examiner claims to disclose unstructured conditions (col. 3, lines 52-67, col. 4, lines 1-15 and 30-50 in Cheng) actually disclose structured conditions (e.g., $< <= > >=$).

Chaudhuri does not cure the defect in Cheng. While Chaudhuri discloses merging two separate indexes into a database table, it does not teach producing a combined index of the structured and unstructured data columns. Specifically, Chaudhuri does not teach making a combined index that facilitates handling queries that include both structured and unstructured data. Chaudhuri only discloses merging two indexes into one index to consume less memory. Thus, since neither Cheng nor Chaudhuri, alone or in combination, teach, disclose, or suggest producing a data structure that facilitates associative access via a query with both structured and unstructured conditions, claim 1 is patentable over these references.

Additionally, the Office Action provides no motivation to combine the references. Furthermore, even if there was a motive to combine the references, the combination of references would still not be operative to teach or suggest generating a combined index of unstructured and structured data columns as recited in claim 1. While Cheng may facilitate an outer join, and while Chaudhuri may discuss merging indexes, neither a merged index nor the result of the

Cheng outer join would provide the associative access described in claim 1. For this additional reason, the rejection should be withdrawn.

Claims 2- 9 depend from claim 1, claim 1 has been shown to be not obvious in light of the references, and thus claims 2-9 are similarly not obvious.

Claim 10

Claim 10 concerns a database management system that includes an indexing logic that generates an index structure that combines an unstructured data column and structured data column to facilitate data retrieval using a query that includes conditions associated to both the structured and unstructured data column.

Cheng discloses a database table produced as the result of an outer join, where the results may include both structured and unstructured data columns. However, Cheng does not disclose an indexing logic that produces an index to this viewable result. Chaudhuri does not remedy the deficiency in Cheng. Although Chaudhuri discloses merging two indexes into one index, it does not disclose an indexing logic that produces the combined index structure. Since neither Cheng nor Chaudhuri disclose the indexing logic, it then follows that neither discloses nor suggests providing for data retrieval based on a query that includes conditions associated to both the structured and unstructured data columns as recited in claim 1. Therefore, since the references, neither alone nor in combination teach or suggest every claimed element or limitation in claim 10, it is patentably distinct over the references.

Claims 11- 15 depend from claim 10, claim 10 has been shown to be not obvious in light of the references, and thus claims 11-15 are similarly not obvious.

Claim 16

Claim 16 concerns a method for searching a data table that has both a structured data column and an unstructured data column. Cheng discloses a viewable result produced from an outer join of two tables, one of which may include structured data and the other of which may disclose unstructured data. But Cheng does not disclose a single table that has both structured and unstructured data. Additionally, claim 16 also includes generating an index structure based

on the converted unstructured data and structured data and then searching the table using that index structure. The search may be a query that has conditions from both the structured and the unstructured data. Neither Cheng nor Chaudhuri disclose generating the index structure. Additionally, neither Cheng nor Chaudhuri disclose searching the table using the index structure, where the search has conditions from both the structured and unstructured data. Therefore, since the references, neither alone nor in combination teach or suggest every claimed element or limitation in claim 16, it is patentably distinct over the references.

Claims 17- 21 depend from claim 16, claim 16 has been shown to be not obvious in light of the references, and thus claims 17-21 are similarly not obvious.

Claim 21

Claim 21 includes the additional limitation that the structured data is an unstructured data that has been converted to a structured form. The Examiner asserts that Cheng teaches means for converting unstructured data to a structured form. The Examiner cites col. 3, lines 25-67 as support for this assertion. The reference in general concerns an outer join that may include two different types of data. More specifically, col. 3, lines 25-67 concern outer join predicates, not converting unstructured to structured data in the context of generating an index structure that facilitates searching of a data table via a query having conditions from both structured and unstructured data. For this additional reason, claim 21 is patentably distinct over the references.

Claims 2, 3, 4, 6, 11, 13, 14, 18, 19, and 20

Claims 2, 3, 4, 6, 11, 13, 14, 18, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Whang. These claims are dependent claims. As described above, the independent claims from which they depend are not obvious in light of Cheng and Chaudhuri. Whang does not cure the defects in Cheng and Chaudhuri, and thus these claims are distinctly patentable over the references.

Claims 2 and 18

Claims 2 and 18 include the additional limitation of generating an inverted index table based on an unstructured data column. Whang discloses an inverted index storage structure. However, Whang does not disclose that the inverted index table is built from an unstructured data column that will also be used to produce a combined index. Additionally, Whang does not disclose producing a combined index that facilitates using a query that includes both structured and unstructured conditions. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claims 2 and 18. For this additional reason, these claims are patentably distinct over the references.

Claims 3 and 13

Claims 3 and 13 include the additional limitation of tokenizing an unstructured data column into tokens or using a logic to perform this action. Whang discloses tokenizing a file. However, Whang does not disclose that the tokenized words are taken from an unstructured data column that will also be used to produce a combined index. Additionally, Whang does not disclose using the tokenized column to facilitate producing a combined index that facilitates using a query that includes both structured and unstructured conditions. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claims 3 and 13. For this additional reason, these claims are patentably distinct over the references.

Claims 4, 11, 14, 19, and 20

Claims 4, 11, 14, 19, and 20 contain additional limitations related to generating, using, and/or referencing a B-tree as the combined index, where the B-tree is derived from the inverted index table. Whang discloses a B-tree. However, Whang discloses a B-tree that is based on tokens that access large objects like files. Whang does not disclose multi-level branching based on a combined index. Using the B-tree disclosed in Whang, there would be no way to process a query that includes both structured and unstructured data and/or conditions. Additionally, the Whang B-tree does not illustrate a second level of branching. A keyword is simply used to

retrieve a document. Since neither Cheng, Chaudhuri, nor Whang disclose the combined index, it is not surprising that none of the references take the next step and provide multi-level branching, where one level is based on structured data/conditions and the second level is based on unstructured data/conditions, or vice versa. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claims 4, 11, 14, 19, and 20. For this additional reason, these claims are patentably distinct over the references.

Claim 6

Claim 6 includes the additional limitation of adding a structured data column to an inverted index. While Whang discloses an inverted index, it is not associated with a combined index that provides associative access using a query that has both structured and unstructured data. Therefore, it is impossible in Whang to add a structured data column to a data structure that does not exist. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claim 6. For this additional reason, this claim is patentably distinct over the references.

Claim 5

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng, Chaudhuri, and Whang, and further in view of Beavin. This claim is a dependent claim. As described above, the independent claim from which it depends is not obvious in light of Cheng, Chaudhuri, and Whang. Beavin does not cure the defects in Cheng, Chaudhuri, and Whang and thus this claim is distinctly patentable over the references.

Claim 5 includes the additional limitation of tokenizing, including parsing text in the unstructured data column into individual words that become tokens. Beavin discloses parsing text. However, neither Cheng, Chaudhuri, Whang, nor Beavin disclose a combined index that provides associative access using a query that has both structured and unstructured data. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claim 5. For this additional reason, this claim is patentably distinct over the references.

Claims 8, 9, and 15

Claims 8, 9, and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng and Chaudhuri, and further in view of Nelson. These claims are all dependent claims. As described above, the independent claims from which they depend are not obvious in light of Cheng and Chaudhuri. Nelson does not cure the defects in Cheng and Chaudhuri, and thus these claims are distinctly patentable over the references.

Claims 8 and 15

Claims 8 and 15 include the additional limitation of the unstructured data including image, video, or audio data. Nelson discloses an information retrieval system that stores unstructured data. However, neither Cheng, Chaudhuri, nor Nelson disclose a combined index that provides associative access using a query that has both structured and unstructured data. Therefore, it is understandable that none of the references teach a combined index that provides associative access to a database table that may store image, video, or audio data, where the access occurs through a query that has both structured and unstructured data and/or conditions. Thus, the combination of references does not teach, disclose, or suggest each and every limitation or claimed element in claims 8 and 15. For this additional reason, these claims are patentably distinct over the references.

Claim 9

Claim 9 includes the additional limitations of generating a signature for each of the data of the unstructured data column, generating an inverted index table based on that signature and then generating a tree index of the inverted index table to form the combined index. Nelson discloses pre-processing an unstructured data file to acquire some identifiers, but these do not teach the signature as disclosed in the original application. Furthermore, neither Cheng, Chaudhuri, nor Nelson disclose a combined index, and thus it is impossible for any of them, alone or in combination, to disclose generating a combined index or an inverted index table based on that signature. Thus, the combination of references does not teach, disclose, or suggest

each and every limitation or claimed element in claim 9. For this additional reason, this claim is patentably distinct over the references.

In conclusion, Applicant asserts that all the independent claims have been shown to be non-obvious and thus are allowable. Furthermore, the claims that depend from these non-obvious claims should also be allowed. Additionally, Applicant asserts that the dependent claims include additional elements that make them patentably distinguishable over the references of record, and for those additional reasons are likewise allowable.

Applicant therefore respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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Date

Peter Kraguljac
Peter Kraguljac (Reg. No. 38,520)
(216) 363-4162